

Geodynamic Significance of the Tachdamt Formation (Anti-Atlas, Morocco) and Its Correlation with the Munali-Magmatic-Event: Implications for a Large Igneous Province during the early stages of Rodinian Break-up.

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In this study, we present new geochemical and Sm-Nd isotopic data from mafic rocks within the Tachdamt Formation, located in the Anti-Atlas, Morocco, aimed at elucidating its origin and geodynamic significance, leveraging recent geochronological insights. The Tachdamt Formation comprises volcano-sedimentary successions deposited on a shallow platform during the Tonian-Cryogenian period. Notably, it is characterized by flood basalts and has been radiometrically dated to approximately 883 Ma [1], marking the onset of Tonian rifting on the northern margin of the West African Craton.

The Tachdamt Formation likely signifies an early phase of continental rifting during the breakup of Rodinia, suggesting the inception of a passive margin along the northwestern of the West African Craton. Its 883 Ma age corresponds notably with the ca. 880 Ma Munali Magmatic Event on the southern side of the Congo craton [2; 3; 4], implying synchronous magmatism during the initial stages of Rodinian rifting. This alignment in ages suggests that this magmatism played a pivotal role in the formation of passive margins along both the northwestern edge of the West African Craton and the southern edge of the Great Congo Craton.

Furthermore, correlation with the Zambezi-Munali magmatism occurring around 880-860 Ma on the southern edge of the Greater Congo Craton implies the development of a Large Igneous Province (LIP) spanning both the West African Craton and the Greater Congo Craton during Tonian rifting.

[1] Bouougri, E. H., Saquaque, A., Bouougri, M., & Oukarou, S. A. (2020). Provenance and tectonic setting of the Tachdamt and Bleida formations (Anti-Atlas, Morocco): Implications for the evolution of the West African Craton during the Neoproterozoic. *Arabian Journal of Geosciences*.

[2] Evans, D. M. (2011). Geodynamic setting of Neoproterozoic nickel sulphide deposits in eastern Africa.

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[3] Holwell, D. Mitchell, C. Howe, G. Evans, D. Ward, L. Friedman, R. (2017) The Munali Ni sulfide deposit, southern Zambia: A multi-stage, mafic-ultramafic, magmatic sulfide-magnetite-apatite-carbonate megabreccia. *Ore Geology Reviews*.